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UNIVERSITY OF UTAH RESEARCH PARK

17 January 1983

Mr. James H. Anthony
Project Director
Intermountain Power Project
P. O. Box 111, Room 931
Los Angeles, CA 90051

Subject: Consulting Agreement No. 71, Task Assignment-MOD3: Particulate
Emission Rates to Be Used in the Dispersion Model Analysis for
the Intermountain Generating Station (IGS)

Dear Jim:

I am enclosing for review by you and your staff the particulate emission rates that we plan to use in our dispersion model calculations of maximum 24-hour and annual average particulate concentrations attributable to emissions from two-unit and four-unit configurations of the Intermountain Generating Station (IGS). For each combination of averaging time, plant configuration and source, the enclosed tables give the assumed control efficiency, the controlled emission factor and the basis for the emission rate shown in grams per second at the far right of the table. The footnotes at the bottom of each table identify the data sources used to develop the emission rates. The emissions from wind erosion are functions of the mean wind speed. These emissions will be computed by the dispersion model using the actual hourly wind speeds in the 24-hour average concentration calculations and the annual wind-speed distribution in the annual average concentration calculations. The enclosed tables do not consider particulate emissions from the stack(s), which we will assume to be the values listed in Table I of Task Assignment-MOD3 unless otherwise specified.

The computer costs to calculate the particulate air quality impact of emissions from the IGS are much higher than for SO_2 and NO_2 because there are more particulate sources than SO_2 or NO_2 sources. Also, the inclusion in the dispersion model calculations for particulates of the effects of gravitational settling and dry deposition increases computer costs. We will therefore delay the particulate air quality impact calculations until agreement is reached on the particulate emission rates.

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Please call Alan Anderson at (801) 581-0220 if you have any questions about the enclosed tables.

Sincerely yours,

James F. Bowers

James F. Bowers
Principal Scientist

JFB/aj

Enclosure

cc: Mr. Timothy L. Conkin ✓

TABLE 1

PARTICULATE EMISSION RATES FOR THE WORST-CASE
24-HOUR PERIOD FOR A TWO-UNIT PLANT

Source	Control Efficiency (%)	Controlled Emission Factor	Emission Rate Basis	Emission Rate (g/sec)
Reserve Coal Storage	90 ^a	0.16 \bar{u} lbs/(acre-hr) ^a	22 acres ^b	0.444 \bar{u}
Active Coal Storage	90 ^a	0.16 \bar{u} lbs/(acre-hr) ^a	4.3 acres ^c	0.087 \bar{u}
Coal Unloading (Railcars)	99.5 ^d	2.0 x 10 ⁻⁴ lbs/ton ^d	1.61 x 10 ⁴ tons/day ^e	0.017
Coal Unloading (Trucks)	0 ^d	0.04 lbs/ton ^d	1.8 x 10 ³ tons/day ^e	0.378
Coal Crushing	99.8 ^a	3.0 x 10 ⁻⁴ lbs/ton ^a	1.91 x 10 ⁴ tons/day ^d	0.030
Coal Conveying	90 ^a	5.0 x 10 ⁻³ lbs/ton ^a	1.91 x 10 ⁴ tons/day ^d	0.501
Coal Transfers	98.8 ^f	1.2 x 10 ⁻⁴ lbs/ton ^a	1.91 x 10 ⁴ tons/day ^d	0.012
Limestone Handling	90 ^a	2.37 x 10 ⁻² lbs/ton ^a	510 tons/day ^d	0.063
Fly Ash Silo Vents	-	0.02 _d grains/ft	-	0.045 ^d
Fly Ash Unloading	-	9.0 x 10 ⁻⁴ lbs/ton ^b	116 tons/hr ^d	0.020
*Trucking of Solid Waste	50 ^d	11.1 lbs/VMT ^g	194 miles/day ^d	11.31
*Burial of Solid Waste	-	0.116 lbs/ton ^g	173 tons/day ^d	0.105
Solid Waste Soil Stockpile	50 ^d	0.8 \bar{u} lbs/(acre-hr) ^a	1 acre ^d <i>for 16 hrs</i>	0.101 \bar{u}
Haul Road (Coal Trucks)	-	0.72 lbs/VMT ^h	99 miles/day ^b	0.374

TABLE 1 (Continued)

Source	Control Efficiency (%)	Controlled Emission Factor	Emission Rate Basis	Emission Rate (g/sec)
Haul Road (Limestone Trucks)	-	0.50 lbs/VMT ^h	90 miles/day ^b	0.236
Access Road to Solid Waste Area	50 ^d	5 lbs/VMT ⁱ	24 miles/day ^d	0.630

^a Based on the PEDco Environmental Inc. BACT Evaluation (October 24, 1979).

^b Derived from the Black and Veatch second preliminary report (December 16, 1982).

^c Based on Drawing No. 9255-9CHB-S1681.

^d Values received directly from Tim Conkin.

^e Based on the assumptions that 90 percent of the coal is delivered by rail and that the maximum amount of coal received in 24-hours is 0.3 percent of the annual coal consumption.

^f Taken from the Stearns-Roger review of the PEDco BACT evaluation (April 24, 1980).

^g Taken from the TRC Environmental Consultants, Inc., 1981: Coal Mining Emission Factor Development and Modeling Study. TRC, Englewood, CO.

^h Taken from Midwest Research Institute, 1979: Iron and Steel Plant Open Source Fugitive Emission Evaluation. EPA Report 600/2-79-103. Midwest Research Institute, Kansas City, MO.

ⁱ Derived from AP-42.

TABLE 2

PARTICULATE EMISSION RATES FOR THE WORST-CASE
24-HOUR PERIOD FOR A FOUR-UNIT PLANT

Source	Control Efficiency (%)	Controlled Emission Factor	Emission Rate Basis	Emission Rate (g/sec)
Reserve Coal Storage	90 ^a	0.16 \bar{u} lbs/(acre-hr) ^a	44 acres ^b	0.887 \bar{u}
Active Coal Storage	90 ^a	0.16 \bar{u} lbs/(acre-hr) ^a	8.6 acres ^c	0.173 \bar{u}
Coal Unloading (Railcars)	99.5 ^d	2.0 x 10 ⁻⁴ lbs/ton ^d	3.57 x 10 ⁴ tons/day ^e	0.037
Coal Unloading (Trucks)	0	0.04 lbs/ton ^d	3600 tons/day ^e	0.756
Coal Crushing	99.8 ^a	3.0 x 10 ⁻⁴ lbs/ton ^a	3.82 x 10 ⁴ tons/day ^d	0.060
Coal Conveying	90 ^a	5.0 x 10 ⁻³ lbs/ton ^a	3.82 x 10 ⁴ tons/day ^d	1.003
Coal Transfers	98.8 ^f	1.2 x 10 ⁻⁴ lbs/ton ^a	3.82 x 10 ⁴ tons/day ^d	0.024
Limestone Handling	90 ^a	2.37 x 10 ⁻² lbs/ton ^a	1020 tons/day ^d	0.127
Fly Ash Silo Vents	-	0.02 _d grains/ft	-	0.089 ^d
Fly Ash Unloading	-	9.0 x 10 ⁻⁴ lbs/ton ^b	232 tons/hr ^d	0.041
Trucking of Solid Waste	50 ^d	11.1 lbs/VMT ^g	388 _d miles/day	22.61
Burial of Solid Waste	-	0.116 lbs/ton ^g	346 tons/day ^d	0.211
Solid Waste Soil Stockpile	50 ^d	0.8 \bar{u} lbs/(acre-hr) ^a	1 acre ^d	0.101 \bar{u}
Haul Road (Coal Trucks)	-	0.72 lbs/VMT ^h	198 miles/day ^b	0.748

TABLE 2 (Continued)

Source	Control Efficiency (%)	Controlled Emission Factor	Emission Rate Basis	Emission Rate (g/sec)
Haul Road (Limestone Trucks)	-	0.50 lbs/VMT ^h	180 miles/day ^b	0.472
Access Road to Solid Waste Area	50 ^d	5 lbs/VMT	24 miles/day ^d	0.630

^a Based on the PEDco Environmental Inc. BACT Evaluation (October 24, 1979).

^b Derived from the Black and Veatch second preliminary report (December 16, 1982).

^c Based on Drawing No. 9255-9CHB-S1681.

^d Values received directly from Tim Conkin.

^e Based on the assumptions that 90 percent of the coal is delivered by rail and that the maximum amount of coal received in 24-hours is 0.3 percent of the annual coal consumption.

^f Taken from the Stearns-Roger review of the PEDco BACT evaluation (April 24, 1980).

^g Taken from the TRC Environmental Consultants, Inc., 1981: Coal Mining Emission Factor Development and Modeling Study. TRC, Englewood, CO.

^h Taken from Midwest Research Institute, 1979: Iron and Steel Plant Open Source Fugitive Emission Evaluation. EPA Report 600/2-79-103. Midwest Research Institute, Kansas City, MO.

ⁱ Derived from AP-42.

TABLE 3

ANNUAL PARTICULATE EMISSION RATES FOR A TWO-UNIT PLANT

Source	Control Efficiency (%)	Controlled Emission Factor	Emission Rate Basis	Emission Rate (g/sec)
Reserve Coal Storage	90 ^a	0.16 \bar{u} lbs/(acre-hr) ^a	22 acres ^b and 275 dry days	0.334 \bar{u}
Active Coal Storage	90 ^a	0.16 \bar{u} lbs/(acre-hr) ^a	4.3 acres ^c and 275 dry days	0.065 \bar{u}
Coal Unloading (Railcars)	99.5 ^d	2.0 x 10 ⁻⁴ lbs/ton ^d	5.34 x 10 ⁶ tons/year ^e	0.015
Coal Unloading (Trucks)	0 ^d	0.04 lbs/ton ^d	5.93 x 10 ⁵ tons/year ^e	0.341
Coal Crushing	99.8 ^a	3.0 x 10 ⁻⁴ lbs/ton ^a	5.93 x 10 ⁶ tons/year ^d	0.026
Coal Conveying	90 ^a	5.0 x 10 ⁻³ lbs/ton ^a	5.93 x 10 ⁶ tons/year ^d	0.426
Coal Transfers	98.8 ^f	1.2 x 10 ⁻⁴ lbs/ton ^a	5.93 x 10 ⁶ tons/year ^d	0.010
Limestone Handling	90 ^a	2.37 x 10 ⁻² lbs/ton ^a	1.58 x 10 ⁵ tons/year ^d	0.054
Fly Ash Silo Vents	-	0.02 _d grains/ft ³	-	0.028 ^d
Fly Ash Unloading	-	3.0 x 10 ⁻⁴ lbs/ton ^b	116 tons/hr ^d	0.006
*Trucking of Solid Waste	50 ^d	11.1 lbs/VMT ^g	4.85 x 10 ⁴ miles/year ^d	7.74
Burial of Solid Waste	-	0.116 lbs/ton ^g	4.32 x 10 ⁴ tons/year ^d	0.072
Solid Waste Soil Stockpile	50 ^d	0.8 \bar{u} lbs/(acre-hr) ^a	1 acre ^d and 275 dry days	0.076 \bar{u}
Haul Road (Coal Trucks)	-	0.72 lbs/mile ^h	33,750 miles/year ^b	0.349

TABLE 3 (Continued)

Source	Control Efficiency (%)	Controlled Emission Factor	Emission Rate Basis	Emission Rate (g/sec)
Haul Road (Limestone Trucks)	-	0.50 lbs/mile ^h	12,624 miles/year ^b	0.091
Access Road to Solid Waste Area	50 ^d	5 lbs/VMT ⁱ	4,520 miles/year ^d	0.325

^a Based on the PEDco Environmental Inc. BACT Evaluation (October 24, 1979).

^b Derived from the Black and Veatch second preliminary report (December 16, 1982).

^c Based on Drawing No. 9255-9CHB-S1681.

^d Values received directly from Tim Conkin.

^e Based on the assumptions that 90 percent of the coal is delivered by rail and that the maximum amount of coal received in 24-hours is 0.3 percent of the annual coal consumption.

^f Taken from the Stearns-Roger review of the PEDco BACT evaluation (April 24, 1980).

^g Taken from the TRC Environmental Consultants, Inc., 1981: Coal Mining Emission Factor Development and Modeling Study. TRC, Englewood, CO.

^h Taken from Midwest Research Institute, 1979: Iron and Steel Plant Open Source Fugitive Emission Evaluation. EPA Report 600/2-79-103. Midwest Research Institute, Kansas City, MO.

ⁱ Derived from AP-42.

TABLE 4

ANNUAL PARTICULATE EMISSION RATES FOR A FOUR-UNIT PLANT

Source	Control Efficiency (%)	Controlled Emission Factor	Emission Rate Basis	Emission Rate (g/sec)
Reserve Coal Storage	90 ^a	0.16 \bar{u} lbs/(acre-hr) ^a	44 acres ^b and 275 dry days	0.668 \bar{u}
Active Coal Storage	90 ^a	0.16 \bar{u} lbs/(acre-hr) ^a	8.6 acres ^c and 275 dry days	0.131 \bar{u}
Coal Unloading (Railcars)	99.5 ^d	2.0 x 10 ⁻⁴ lbs/ton ^d	1.07 x 10 ⁷ tons/year ^e	0.031
Coal Unloading (Trucks)	0 ^d	0.04 lbs/ton ^d	1.19 x 10 ⁶ tons/year ^e	0.684
Coal Crushing	99.8 ^a	3.0 x 10 ⁻⁴ lbs/ton ^a	1.19 x 10 ⁷ tons/year ^d	0.051
Coal Conveying	90 ^a	5.0 x 10 ⁻³ lbs/ton ^a	1.19 x 10 ⁷ tons/year ^d	0.856
Coal Transfers	98.8 ^f	1.2 x 10 ⁻⁴ lbs/ton ^a	1.19 x 10 ⁷ tons/year ^d	0.021
Limestone Handling	90 ^a	2.37 x 10 ⁻² lbs/ton ^a	3.16 x 10 ⁵ tons/year ^d	0.108
Fly Ash Silo Vents	-	0.02 ₃ ^d grains/ft	-	0.057 ^d
Fly Ash Unloading	-	3.0 x 10 ⁻⁴ lbs/ton ^b	232 tons/hr ^d	0.012
*Trucking of Solid Waste	50 ^d	11.1 lbs/VMT ^g	9.70 x 10 ⁴ miles/year ^d	15.48
Burial of Solid Waste	-	0.116 lbs/ton ^g	8.65 x 10 ⁴ tons/year ^d	0.144
Solid Waste Soil Stockpile	50 ^d	1.48 lbs/(acre-hr) ^a	1 acre ^d and 275 dry days	0.076 \bar{u}
Haul Road (Coal Trucks)	-	0.72 lbs/VMT ^h	67,500 miles/year ^b	0.699

TABLE 4 (Continued)

Source	Control Efficiency (%)	Controlled Emission Factor	Emission Rate Basis	Emission Rate (g/sec)
Haul Road (Limestone Trucks)	-	0.50 lbs/mile ^h	25,248 miles/year ^b	0.182
Access Road to Solid Waste Area	50 ^d	5 lbs/VMT ⁱ	4,520 miles/year ^d	0.325

^a Based on the PEDco Environmental Inc. BACT Evaluation (October 24, 1979).

^b Derived from the Black and Veatch second preliminary report (December 16, 1982).

^c Based on Drawing No. 9255-9CHB-S1681.

^d Values received directly from Tim Conkin.

^e Based on the assumptions that 90 percent of the coal is delivered by rail and that the maximum amount of coal received in 24-hours is 0.3 percent of the annual coal consumption.

^f Taken from the Stearns-Roger review of the PEDco BACT evaluation (April 24, 1980).

^g Taken from the TRC Environmental Consultants, Inc., 1981: Coal Mining Emission Factor Development and Modeling Study. TRC, Englewood, CO.

^h Taken from Midwest Research Institute, 1979: Iron and Steel Plant Open Source Fugitive Emission Evaluation. EPA Report 600/2-79-103. Midwest Research Institute, Kansas City, MO.

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